STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION

DATE: February 3, 2016

FROM: Matt Urban
Wetlands Program Manager

AT (OFFICE): Department of Transportation
Bureau of Environment

SUBJECT Dredge & Fill Application
Lancaster, 40522
(DES#2015-01656 – Emergency Follow-up)

TO Gino Infascelli, Public Works Permitting Officer
New Hampshire Wetlands Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Forwarded herewith is the **Emergency Follow-Up** application package prepared by NH DOT Bureau of Highway Design for the subject Major impact project. This project is classified as Major per Env-Wt 303.02(p). This project begins on NH Route 135 in the Town of Lancaster approximately 1,100 feet north of the Lancaster-Dalton Town line. The work on NH Route 135 consisted of emergency slope repairs, the replacement of failing twin 24" metal pipes with the installation of an 8'x6 box culvert including an overflow pipe. To address a portion of the failing slopes a retaining wall was also constructed. The project also consisted of, shoulder repair, roadway repair, slope repair, full box reconstruction and guardrail replacement.

This project was not reviewed at a Natural Resource Agency Coordination Meeting.

This project does not require mitigation.

The lead people to contact for this project are Jim Marshall, Highway Design (271-2524 or jamarshall@dot.state.nh.us) or Matt Urban, Wetlands Program Manager, Bureau of Environment (271-3226 or murban@dot.state.nh.us).

A payment voucher has been processed for this application (Voucher #425659) in the amount of $4,985.20.

If and when this application meets with the approval of the Bureau, please send the permit directly to Matt Urban, Wetlands Program Manager, Bureau of Environment.

MRU:mru
Enclosures
cc:
BOE Original
Town of Lancaster (4 copies via certified mail)
NH DOT Bureau of Construction
Randy Talon, Environment
Carol Henderson, NH Fish and Game
Maria Turr, USF&WS
Edna Feighner, NHDHR (NHDOT Review within)
Mark Kern, EPA
Michael Hicks, US Army Corp of Engineers
Connecticut River Local Advisory Committee (via certified mail)

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THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF ENVIRONMENTAL SERVICES
LAND RESOURCES MANAGEMENT
WETLANDS BUREAU
29 Hazen Drive, PO Box 95, Concord, NH 03302-0095
Phone: (603) 271-2147 Fax: (603) 271-6588
http://des.nh.gov/organization/divisions/water/wetlands

PERMIT APPLICATION

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

1. REVIEW TIME:
Indicate your Review Time below. Refer to Guidance Document A for instructions.

☒ Standard Review (Minimum, Minor or Major Impact) ☐ Expedited Review (Minimum Impact)

2. PROJECT LOCATION:
Separate applications must be filed with each municipality that jurisdictional impacts will occur in.

ADDRESS: **NH Route 135**			TOWN/CITY: **Lancaster**
TAX MAP:	BLOCK:	LOT:	UNIT:

USGS TOPO MAP WATERBODY NAME: **Connecticut River** ☐ NA | STREAM WATERSHED SIZE: **3.3 mi2** ☐ NA

LOCATION COORDINATES (If known): **Lat: 44 26' 35" Long: -71 39' 28"** ☒
Latitude/Longitude ☐ UTM ☐ State Plane

3. PROJECT DESCRIPTION:
Provide a brief description of the project outlining the scope of work. Attach additional sheets as needed to provide a detailed explanation of your project. DO NOT reply "See Attached" in the space provided below.

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4. RELATED PERMITS, ENFORCEMENT, EMERGENCY AUTHORIZATION, SHORELAND, ALTERATION OF TERRAIN, ETC...

Emergency Authorization (2015-01656)

5. NATURAL HERITAGE BUREAU & DESIGNATED RIVERS:
See the Instructions & Required Attachments document for instructions to complete a & b below.

a. Natural Heritage Bureau File ID: NHB **16** - **0285**

b. ☒ Designated River the project is in ¼ miles of: **Connecticut River** ; and
date a copy of the application was sent to Local River Advisory Committee: Month: __ Day: __ Year: ____
☐ NA

MUNICIPAL SIGNATURES

10. CONSERVATION COMMISSION SIGNATURE

The signature below certifies that the municipal conservation commission has reviewed this application, and:

1. Waives its right to intervene per RSA 482-A:11;
2. Believes that the application and submitted plans accurately represent the proposed project; and
3. Has no objection to permitting the proposed work.

⇨ Authorized Commission Signature	Print name legibly	Date

DIRECTIONS FOR CONSERVATION COMMISSION

1. Expedited review ONLY requires that the conservation commission's signature is obtained in the space above.
2. The Conservation Commission signature should be obtained prior to the submittal of the original application and four copies to the town/city clerk for mailing to the DES.
3. The Conservation Commission may refuse to sign. If the Conservation Commission does not sign this statement for any reason, the application is not eligible for expedited review and the application will reviewed in the standard review time frame.

11. TOWN / CITY CLERK SIGNATURE

As required by Chapter 482-A:3 (amended 1991), I hereby certify that the applicant has filed five application forms, five detailed plans, and five USGS location maps with the town/city indicated below and I have received and retained certified postal receipts (or copies) for all abutters identified by the applicant.

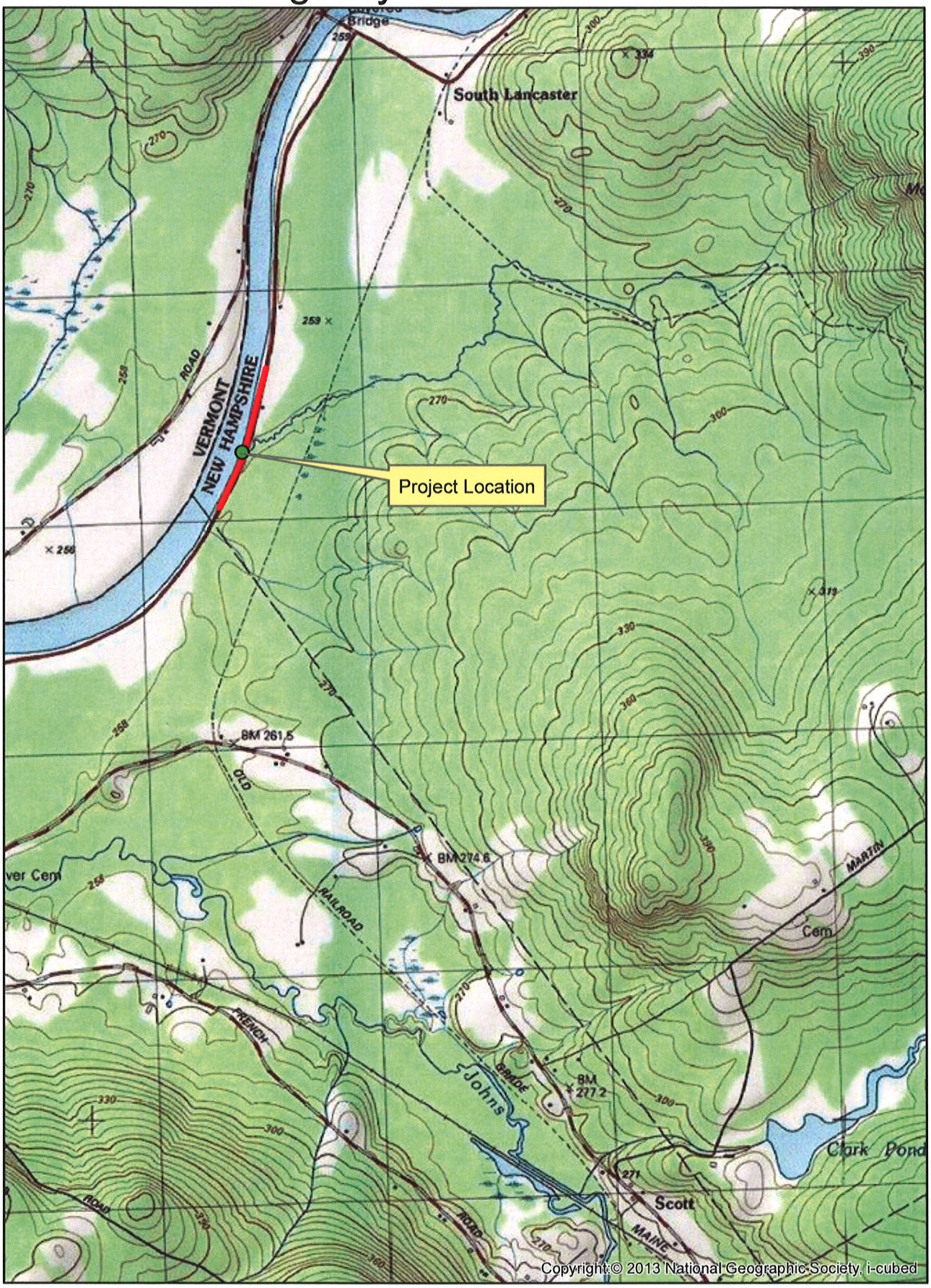
⇨ Town/City Clerk Signature	Print name legibly	Town/City	Date

DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3,I(d):

1. For applications where "Expedited Review" is checked on page 1, accept the application for mailing only if the Conservation Commission signature has been sought;
2. Collect the postal receipts demonstrating that all abutters and the Local Advisory Committee were sent proper notice;
3. Collect any administrative fees, not to exceed $10 plus the cost of postage by certified mail (RSA 482-A:3,I).
4. IMMEDIATELY sign the original application and four copies in the signature space provided above;
5. Retain one copy of the application form, one complete set of attachments and the postal receipts demonstrating that all abutters and the Local River Advisory Committee were notified and make them reasonably accessible to the public;
6. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board in accordance with RSA 482-A:3, I; and
7. IMMEDIATELY send the ORIGINAL application form, one complete set of attachments and filing fee, by CERTIFIED MAIL to the NHDES Wetlands Bureau at the address indicated on page 1 of this application. (DO NOT HOLD FOR CONSERVATION COMMISSION SIGNATURE).

Lancaster Emergency



THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF ENVIRONMENTAL SERVICES
LAND RESOURCES MANAGEMENT
WETLANDS BUREAU
29 Hazen Drive, PO Box 95, Concord, NH 03302-0095
Phone: (603) 271-2147 Fax: (603) 271-6588
http://des.nh.gov/organization/divisions/water/wetlands/index.htm
Permit Application Status: http://des.nh.gov/onestop/index.htm

PERMIT APPLICATION – ATTACHMENT A
MINOR & MAJOR 20 QUESTIONS

Env-Wt 302.04 Requirements for Application Evaluation – For any major or minor project, the applicant shall demonstrate by plan and example that the following factors have been considered in the project's design in assessing the impact of the proposed project to areas and environments under the department's jurisdiction. Respond with statements demonstrating:

1. The need for the proposed impact.

Emergency Follow-up Application (DES 2015-01656). This project begins on NH Route 135 in Lancaster approximately 1,100 feet north of the Lancaster-Dalton Town line. The work on NH Route 135 consists of emergency slope repairs, the replacement of failing twin 24" metal pipes with the installation of an 8'x6 box culvert including an overflow pipe. To address a portion of the failing slopes a retaining wall has been constructed. The project also consisted of, shoulder repair, roadway repair, slope repair, full box reconstruction and guardrail replacement.

2. That the alternative proposed by the applicant is the one with the least impact to the wetlands or surface waters on site.

The alternatives considered are as follows:

-To address the failing embankments of the Connecticut River the Department considered repairing the entire length of embankment with a rip-rap slope that would be keyed into the channel of the Connecticut River. However, due to the potential impacts to Dwarf Wedge Mussels and a general desire to reduce channel impacts the Department did not select this alternative.

-The constructed alternative consisted of a combination of rip-rap slopes along with a retaining wall. The retaining wall allowed the Department to reduce channel impacts.

- To address the failing twin 24" pipes the department considered replacement in-kind, an intermediate upsizing to an 8x6 box, and a fully compliant crossing with a span of approximately 29' required.

The Department chose to construct the intermediate crossing that consisted of an 8'x6' box structure due to cost, and constructability. Due to the emergency nature of the work there was not sufficient time available to design a fully compliant bridge. The ability to upsize the existing structure with a precast box seemed to be a better solution. The Department also included an overflow pipe to accommodate flood conditions.

3. The type and classification of the wetlands involved.

R2UB2
Bank

4. The relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters.

The unnamed stream that flows through the crossing outlets directly into the Connecticut River.

5. The rarity of the wetland, surface water, sand dunes, or tidal buffer zone area.

The Connecticut River is a Designated River with a Rural Classification.

6. The surface area of the wetlands that will be impacted.

7,300ft^2 Riverine (6,945^2 temporary, 355ft^2 permanent)
17,626ft^2 Bank (1,894ft^2 temporary, 15,732ft^2 permanent)

7. The impact on plants, fish, and wildlife, but not limited to:
   a. Rare, special concern species;
   b. State and federally listed threatened and endangered species;
   c. Species at the extremities of their ranges;
   d. Migratory fish and wildlife;
   e. Exemplary natural communities identified by the DRED-NHB; and
   f. Vernal pools.

a. The NHB results identified the Dwarf-Wedge Mussel.

b. The results of the USF&WS IPaC search identified Dwarf Wedge mussels, Canada Lynx, and Northern long-eared Bat. The Department coordinated with USF&WS and determined that no effect for NLEB and Canada Lynx. A TOY restriction was implemented for clearing to avoid any concerns for the NLEB. As for the Dwarf Wedge Mussels the Department reduced direct impacts to the channel of the river and implemented commitments to ensure stability and erosion protections to avoid potential impacts. The USF&WS concurred with this approach.

c. There were no species identified at the extremities of their range.

d. No migratory fish or wildlife were identified in this project area.

e. No exemplary natural communities were identified by DRED-NHB in this area.

f. There were no vernal pools located within the project area.

8. The impact of the proposed project on public commerce, navigation and recreation.

During construction this section of road was closed and a detour was made available. Navigation of the Connecticut River was not restricted as a result of construction.

9. The extent to which a project interferes with the aesthetic interests of the general public. For example, where an applicant proposes the construction of a retaining wall on the bank of a lake, the applicant shall be required to indicate the type of material to be used and the effect of the construction of the wall on the view of other users of the lake.

The project will not significantly interfere with the aesthetic interests of the general public. The most notable visual change will occur from the traveling on the river, the new retaining wall will be a contrast to the former vegetated embankment.

10. The extent to which a project interferes with or obstructs public rights of passage or access. For example, where the applicant proposes to construct a dock in a narrow channel, the applicant shall be required to document the extent to which the dock would block or interfere with the passage through this area.

The project will not interfere with or obstruct public rights of passage or access. A detour was provided during construction.

11. The impact upon the abutting pursuant to RSA 482-A:11, II. For example, if an applicant is proposing to riprap a stream, the applicant shall be required to document the effect of such work on upstream and downstream abutting properties.

The embankment all along the Connecticut river in this area is severely eroding. It would probably be a benefit if similar work was done in this area. However, most of the land between the road and the river is state owned and it would be unlikely that abutting property owners would be proposing similar work.

12. The benefit of a project to the health, safety, and well-being of the general public.

The project will provide a safer, longer lasting structure and roadway. Restoring the roadway, river embankment

and cross culvert, benefits commerce, trade, emergency access, etc., for the general public.

13. The impact of a proposed project on quantity or quality of surface and ground water. For example, where an applicant proposes to fill wetlands the applicant shall be required to document the impact of the proposed fill on the amount of drainage entering the site versus the amount of drainage exiting the site and difference in the quality of water entering and exiting the site.

The project implemented a SWPPP and Erosion Controls were in place to protect water quality throughout construction.

14. The potential of a proposed project to cause or increase flooding, erosion, or sedimentation.

Flooding: The 8x6 box is a larger structure than what previously existed. Its anticipated that this structure in combination with the overflow pipe should alleviate any previous overtopping of the road that used to occur.

It's not anticipated that the constructed work will perpetuate any erosion or sedimentation issues.

15. The extent to which a project that is located in surface waters reflects or redirects current or wave energy which might cause damage or hazards.

Surface waters will not be reflected or redirected as a result of this project.

16. The cumulative impact that would result if all parties owning or abutting a portion of the affected wetland or wetland complex were also permitted alternations to the wetland proportional to the extent of their property rights. For example, an applicant who owns only a portion of a wetland shall document the applicant's percentage ownership of that wetland and the percentage of that ownership that would be impacted.

The work consisted of repairs to the embankment of the river and a cross pipes. It's not anticipated that abutting property owners would be proposing similar work.

17. The impact of the proposed project on the values and functions of the total wetland or wetland complex.

The value and functions of the wetland/surface water resources will not be impacted as a result of the constructed work.

18. The impact upon the value of the sites included in the latest published edition of the National Register of Natural Landmarks, or sites eligible for such publication.

This project is not located in or near any Natural Landmarks listed on the National Register.

19. The impact upon the value of areas named in acts of congress or presidential proclamations as national rivers, national wilderness areas, national lakeshores, and such areas as may be established under federal, state, or municipal laws for similar and related purposes such as estuarine and marine sanctuaries.

There are no areas named in acts of congress or presidential proclamations as national rivers, national wildness areas, or national lakeshores that will be impacted as a result of this project.

20. The degree to which a project redirects water from one watershed to another.

The project as proposed will not redirect water from one watershed to another.

Additional comments

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF BRIDGE MAINTENANCE
7 Hazen Drive, PO Box 483, Concord, NH 03302-0095
Phone: (603) 271-3667 Fax: (603) 271-1588

WETLANDS PERMIT APPLICATION – ATTACHMENT C
Stream Crossing Requirements & Information

Env-Wt 904.09(a) – If the applicant believes that installing the structure specified in the applicable rule is not practicable then the applicant may propose an alternative design in accordance with this section.

1. Please explain why the structure specified in the applicable rule is not practicable (Env-Wt 101.69 defines practicable as "*available and capable of being done after taking into consideration costs, existing technology, and logistics in light of overall project purposes*") *(question 2, Attachment A, Minor and Major 20 Questions)*;

The unnamed stream flowing directly into the Connecticut River has a drainage area of 3.3 square miles which qualifies this stream as a Tier 3 Crossing. The required span based on regression equations and the 100-year flow from NH Streamstats is 29'-0" for a total bridge replacement. Installing a structure with a 29'-0" span would cost approximately $1,000,000. As an emergency situation the Department did not have time to design a fully compliant bridge. Cost, Constructability, and Time Constraints are all reasons a compliant structure was not practicable. The proposed upgrade to an 8x6 box with an overflow pipe, retaining wall, and rip-rap slopes was still a costly endeavor but it could be accomplished in a shorter period of time.

2. Please explain how the proposed alternative meets the specific design criteria for Tier 2 and Tier 3 crossings to the *maximum extent practicable*. Env-Wt 904.05 Design Criteria for Tier 2 and Tier 3 Stream Crossings – New Tier 2 stream crossings, replacement Tier 2 crossings that do not meet the requirements of Env-Wt 904.07, and new and replacement Tier 3 crossings shall be designed and constructed...

...In accordance with the NH Stream Crossing Guidelines:

The constructed 8'x6' box was an upgrade that addressed future flooding issues.

The existing structure was undersized and when clogged created dangerous backwaters that eventually topped the roadway.

Wildlife passage will be greatly improved through the new structure.

The proposed structure will maintain the flow depths found in the existing structure.

...With bed forms and streambed characteristics necessary to cause water depths and velocities within the crossing structure at a variety of flows to be comparable to those found in the natural channel upstream and downstream of the stream crossing:

Water depths and velocities within the crossing at a variety of flows will be comparable to the existing depths and velocities. These flows are comparable to those found in the natural channel upstream and downstream of the stream crossing.

...To provide a vegetated bank on both sides of the watercourse to allow for wildlife passage:

It is not possible to provide vegetated banks on both sides of the watercourse where the retaining wall was constructed. The inlet side has been vegetated right up to the structure.

...To preserve the natural alignment and gradient of the stream channel, so as to accommodate natural flow regimes and the function of the natural floodplain *(questions 14 and 15, Attachment A, Minor and Major 20 Questions)*;
The constructed project had no effect on the natural alignment and gradient of the stream channel. High flows will not be restricted, and low flows will be maintained as a result of this project.
...To accommodate the 100-year frequency flood and to ensure that there is no increase in flood stages on abutting properties *(questions 11 and 14, Attachment A, Minor and Major 20 Questions)*:
The project is expected to have a positive impact on abutting properties. The structure repair will better serve the abutting properties if they need to travel on the road. The upgrade to an 8x6 box with an overflow pipe is anticipated to eliminate any future flooding issues.
...To simulate a natural stream channel:
The Department placed stone though the bottom of the new box and its anticipated that sediments will accumulate overtime on this stone.
...So as not to alter sediment transport competence *(question 14, Attachment A, Minor and Major 20 Questions)*:
The constructed project will be better suited with the larger structure to competently transport sediments.
Env-Wt 904.09(c)(3) – The alternative design must meet the general design criteria specified in Env-Wt 904.01:
(a) Not be a barrier to sediment transport *(question 14, Attachment A, Minor and Major 20 Questions)*;
Nothing that will be a barrier to sediment transport was installed in this project.
(b) Prevent the restriction of high flows and maintain existing low flows *(question 14, Attachment A, Minor and Major 20 Questions)*;
High flows will not be restricted, and low flows will be maintained as a result of this project.
(c) Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the water body beyond the actual duration of construction *(question 7, Attachment A, Minor and Major 20 Questions)*;
The new box will better accommodate aquatic life passage.
(d) Not cause an increase in the frequency of flooding or overtopping of banks *(question 14, Attachment A, Minor and Major 20 Questions)*;
The proposed project will not affect the chance of flooding. High flows will not be restricted, and low flows will be maintained as a result of this project.
(e) Preserve watercourse connectivity where it currently exists *(question 15, Attachment A, Minor and Major 20 Questions)*;
Connectivity will remain unchanged with the proposed project and will not be worsened.
(f) Restore watercourse connectivity where...
...connectivity previously was disrupted as a result of human activity(ies) *(question 15, Attachment A, Minor and Major 20 Questions)*;
Connectivity will remain unchanged as a result of this project.

...restoration of connectivity will benefit aquatic life upstream or downstream of the crossing *(question 15, Attachment A, Minor and Major 20 Questions)*;
Aquatic life upstream and downstream will not be affected as a result of this project.
(g) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing *(question 14, Attachment A, Minor and Major 20 Questions)*;
The project will not have any adverse impacts upstream or downstream of the work.
(h) Not cause water quality degradation *(question 13, Attachment A, Minor and Major 20 Questions)*.
The project as proposed will not impact the quantity or quality of surface and/or groundwater at this site. Best Management Practices were used to prevent any adverse effect to water quality during construction.

U.S. Army Corps of Engineers
New Hampshire Programmatic General Permit (PGP)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to "work" include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See PGP, GC 5 regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*	x	
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	x	
2.2 Are there proposed impacts to SAS, shellfish beds, special wetlands and vernal pools (see PGP, GC 26 and Appendix A)? Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) website, www.nhnaturalheritage.org, specifically the book Natural Community Systems of New Hampshire.		x
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	x	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)	x	
2.5 The overall project site is more than 40 acres.		x
2.6 What is the size of the existing impervious surface area?	N/A	
2.7 What is the size of the proposed impervious surface area?	N/A	
2.8 What is the % of the impervious area (new and existing) to the overall project site?	N/A	
3. Wildlife	Yes	No
3.1 Has the NHB determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require a NHB determination.)	x	
3.2 Would work occur in any area identified as either "Highest Ranked Habitat in N.H." or "Highest Ranked Habitat in Ecological Region"? (These areas are colored magenta and green, respectively, on NH Fish and Game's map, "2010 Highest Ranked Wildlife Habitat by Ecological Condition.") Map information can be found at: • PDF: www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html.	x	
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		x
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		x
3.5 Are stream crossings designed in accordance with the PGP, GC 21?	x	

PART Env-Wt 404 CRITERIA FOR SHORELINE STABILIZATION

Emergency Follow-up Application (DES 2015-01656). This project begins on NH Route 135 in Lancaster approximately 1,100 feet north of the Lancaster-Dalton Town line. The work on NH Route 135 consists of emergency slope repairs, the replacement of failing twin 24" metal pipes with the installation of an 8'x6 box culvert including an overflow pipe. To address a pertion of the failing slopes a retaining wall has been constructed. The project also consisted of, shoulder repair, roadway repair, slope repair, full box reconstruction and guardrail replacement.

Pursuant to PART Wt 404 Criteria for Shoreline Stabilization, the following addresses each codified section of the Administrative Rules:

Wt 404.01 Least Intrusive Method

The riverbank stabilization treatment proposed is the least intrusive construction method necessary to minimize the disruption to the existing shorelines. The retaining wall and stone treatment can be reasonably constructed utilizing general highway construction methods.

Wt 404.02 Diversion of Water

A clean water bypass was in place to accommodate the work. Also work was completed behind a temporary cofferdam to contain any turbidity that could then be pumped to a temporary treatment area.

Wt 404.03 Vegetative Stabilization

Natural vegetation will be left undisturbed to the maximum extent possible. The only locations being disturbed are the impacted areas on the plan for construction. All newly developed slopes and disturbed areas will have humus and seed applied for turf establishment, which will help stabilize the project area.

Wt 404.04 Rip-Rap

(a) Stone fill, as proposed, is shown on the attached plans to protect the channel and bank as necessary. Stable embankments are necessary to maintain the structural integrity of the bridge during all flow conditions.

(b) (1-5) The minimum and maximum stone size, the gradation, cross sections of the stone fill, proposed location, and other details have been provided on the attached plans. Bedding for the stone fill will consist of natural ground excavated to the proposed underside of the stone fill.

(b) (6) Enclosed are plan sheets to sufficiently indicate the relationship of the project to fixed points of reference, abutting properties, and features of the natural shoreline.

(b) (7) Stone fill is recommended for the limits shown on the attached plans to protect the banks from erosion during flood flows, from scour during all flows, and slopes greater than 2:1 have difficulty supporting vegetation.

(c) This project is not located adjacent to a great pond or water body where the state holds fee simple ownership.

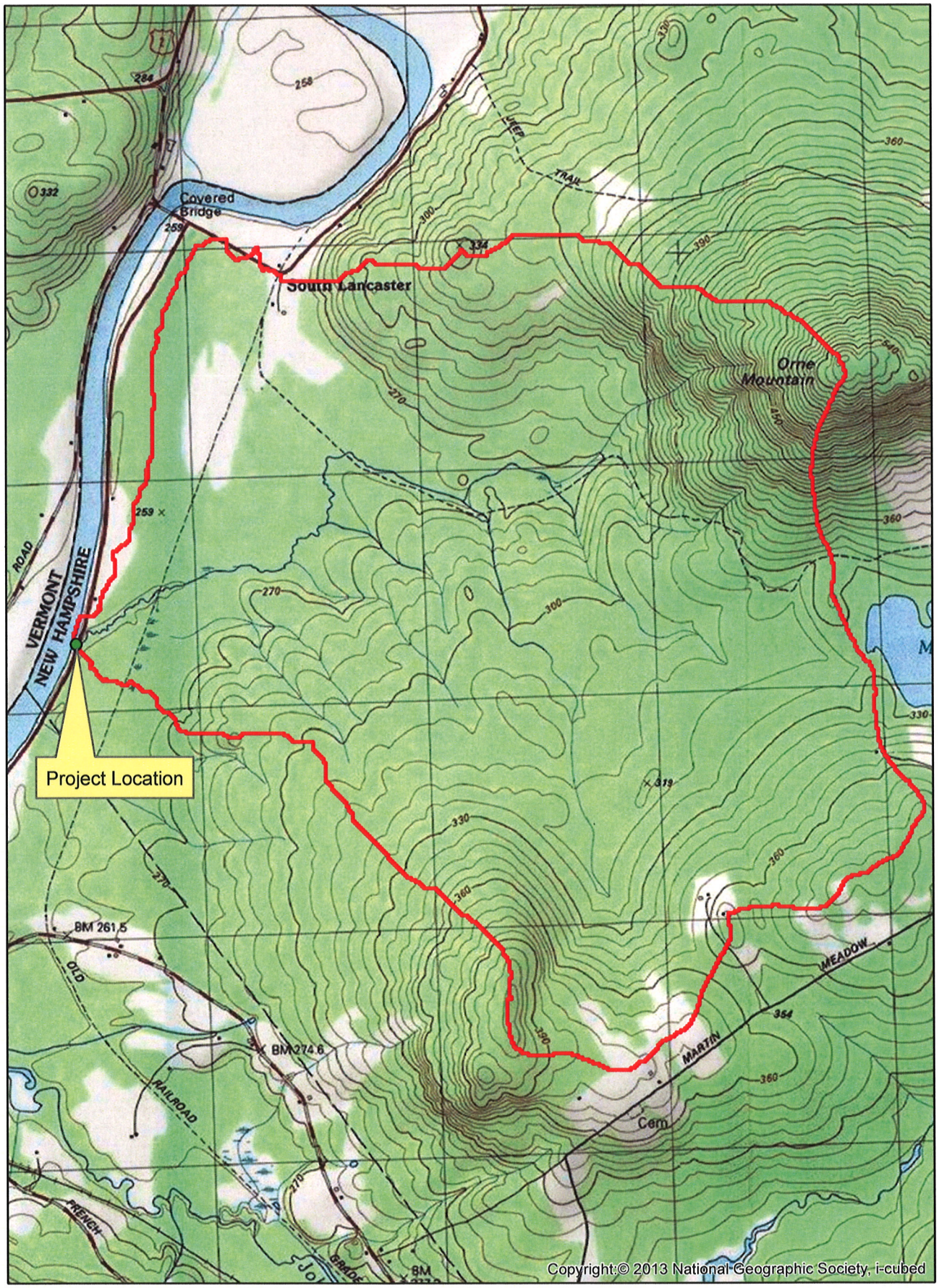
(d) Stone fill is proposed to extend down to and adequately keyed into the channel bottom to prevent possible undermining of the slope.

(e) The construction plan was stamped by a professional engineer.

MITIGATION REPORT

This project was constructed for the purpose of protecting the existing roadway and drainage infrastructure. For that reason mitigation is not proposed.

Lancaster 40522 Watershed: 3.3 Square Miles



StreamStats Version 3.0

Flow Statistics Ungaged Site Report

Date: Fri Jan 29, 2016 9:11:32 AM GMT-5
Study Area: New Hampshire
NAD 1983 Latitude: 44.4429 (44 26 35)
NAD 1983 Longitude: -71.6576 (-71 39 28)
Drainage Area: 3.3 mi2

Peak Flows Region Grid Basin Characteristics			
100% Peak Flow Statewide SIR2008 5206 (3.3 mi2)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	3.3	0.7	1290
Mean April Precipitation (inches)	2.733 (below min value 2.79)	2.79	6.23
Percent Wetlands (dimensionless)	16.3792	0	21.8
Stream Slope 10 and 85 Method (feet per mi)	81.5	5.43	543

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

LowFlows Region Grid Basin Characteristics			
100% Low Flow Statewide (3.3 mi2)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	3.3	3.26	689
Mean Basin Slope from 30m DEM (percent)	8.098	3.19	38.1
Maximum Basin Elevation (feet)	1839.910	260	6290
Percent Coniferous Forest (percent)	22.3653	3.07	56.2
Jan to Mar Basin Centroid Precip (inches)	5.35 (below min value 5.79)	5.79	15.1
Mean Annual Temperature (degrees F)	54.983 (above max value 48.7)	36	48.7
Jun to Oct Mean Basinwide Temp (degrees F)	59.174	52.9	64.4
Jun to Oct Gage Precipitation (inches)	18.0	16.5	23.1
Percent Mixed Forest (percent)	46.2974 (above max value 46.1)	6.21	46.1
Mar to May Gage Precipitation (inches)	6.9	6.83	11.5

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Groundwater Recharge Region Grid Basin Characteristics
100% Groundwater Recharge Statewide 2004 5019 (3.3 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	3.3	3.26	689
Mean Annual Precip at Gage (inches)	36.3	35.83	53.11
Jun to Oct Gage Precipitation (inches)	18.0	16.46	23.11
Mar to May Gage Precipitation (inches)	6.9	6.83	11.54
Mean Annual Precip at Basin Centroid (inches)	37.1 (below min value 37.44)	37.44	75.91
Mean Annual Temperature (degrees F)	54.983 (above max value 48.69)	36.05	48.69
Mean Winter Min Temperature (degrees F)	7.543	0.8	19.88
Percent Coniferous Forest (percent)	22.3653	3.07	56.18
Percent Mixed Forest (percent)	46.2974 (above max value 46.13)	6.21	46.13
Nov to Dec Basin Centroid Precip (inches)	6.42 (below min value 6.57)	6.57	15.2
Mean Annual Snowfall (inches)	73.989	54.46	219.07

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Peak Flows Region Grid Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	36.1	ft3/s				
PK5	56	ft3/s				
PK10	72.4	ft3/s				
PK25	94.7	ft3/s				
PK50	113	ft3/s				
PK100	135	ft3/s				
PK500	188	ft3/s				

http://pubs.usgs.gov/sir/2008/5206/ (http://pubs.usgs.gov/sir/2008/5206/)
Olson_ S.A._ 2009_ Estimation of flood discharges at selected recurrence intervals for streams in New Hampshire: U.S.Geological Survey Scientific Investigations Report 2008-5206_ 57 p.

LowFlows Region Grid Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
D60WIN	1.39	dim				
D70WIN	1.15	dim				
D80WIN	1.02	ft3/s				
D90WIN	0.78	dim				
D95WIN	0.63	dim				
D98WIN	0.54	dim				
M7D2Y WIN	1.07	ft3/s				
M7D10Y WIN	0.57	ft3/s				

D60SPR	6.48	dim				
D70SPR	5.14	dim				
D80SPR	3.79	dim				
D90SPR	2.71	dim				
D95SPR	2	dim				
D98SPR	1.36	dim				
M7D2Y SPR	1.68	ft3/s				
M7D10Y SPR	0.88	ft3/s				
D60SUM	0.56	dim				
D70SUM	0.41	dim				
D80SUM	0.32	dim				
D90SUM	0.21	dim				
D95SUM	0.14	dim				
D98SUM	0.12	dim				
M7D2Y SUM	0.22	ft3/s				
M7D10Y SUM	0.0819	ft3/s				
D60FALL	3.2	dim				
D70FALL	2.47	dim				
D80FALL	1.89	dim				
D90FALL	1.24	dim				
D95FALL	0.83	dim				
D98FALL	0.53	dim				
M7D2Y FAL	1.84	ft3/s				
M7D10Y FAL	0.79	ft3/s				
D60	1.7	ft3/s				
D70	0.84	ft3/s				
D80	0.35	ft3/s				
D90	0.11	ft3/s				
D95	0.0485	ft3/s				
D98	0.0233	ft3/s				
M7D2Y	0.0494	ft3/s				
M7D10Y	0.011	ft3/s				

http://pubs.water.usgs.gov/wrir02-4298 (http://pubs.water.usgs.gov/wrir02-4298)
Flynn_ R.H. and Tasker_ G.D._ 2002_ Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298_ 66 p.

Groundwater Recharge Region Grid Statistics

Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
RCHRG WIN	2.67	in				
RCHRG SPR	6.04	in				
RCHRG SUM	-0.0278	in				

RCHRG FAL	2.5	in				
RCHRG ANN	16	in				

http://pubs.usgs.gov/sir/2004/5019/#StreamStatsDB_2014-11-21 - Copy - Copy.mdb#
(http://pubs.usgs.gov/sir/2004/5019/#StreamStatsDB_2014-11-21 - Copy - Copy.mdb#)
Flynn_ R.H. and Tasker_ G.D._ 2004_ Generalized Estimates from Streamflow Data of Annual and Seasonal Ground-Water-Recharge Rates for Drainage Basins in New Hampshire_ U.S. Geological Survey Scientific Investigations Report 2004-5019_ 67 p.

Memo

NH NATURAL HERITAGE BUREAU
NHB DATACHECK RESULTS LETTER

To: Matt Urban, NH Department of Transportation
7 Hazen Dr.
Concord , NH 03301

From: Amy Lamb, NH Natural Heritage Bureau
Date: 2/2/2016
Re: Review by NH Natural Heritage Bureau
NHB File ID: NHB16-0285 Town: Lancaster Location: NH Route 135
Description: All work was completed under a previous emergency authorization DES#2015-01656. The work consisted of replacing a twin 24" culvert with an 8'x6' box structure. Eroding riverbanks were stabilized including a section where a retaining was had to be constructed.
cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments: This site is within an area flagged for possible impacts to the federally-listed *Alasmidonta heterodon* (dwarf wedgemussel) in the Connecticut River. Contact NHF&G/USFWS.

Invertebrate Species	State[1]	Federal	Notes
Dwarf Wedge Mussel (*Alasmidonta heterodon*)	E	E	Contact the NH Fish & Game Dept and the US Fish & Wildlife Service (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544. U.S. Fish and Wildlife Service, New England Field Office: (603) 223-2541

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
172 Pembroke Rd.
Concord, NH 03301

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
http://www.fws.gov/newengland

July 7, 2015

To Whom It May Concern:

Under Section 7 of the Endangered Species Act, Federal agencies that authorize, fund or carry out an action that may affect a federally listed species are required to ensure their actions do not jeopardize the continued existence of a listed species or adversely modify federally designated critical habitat through consultation with the U.S. Fish and Wildlife Service. As you are aware, the northern long-eared bat (*Myotis septentrionalis*) (NLEB) was recently listed as threatened with an associated interim 4(d) rule (April 2, 2015). The NLEB was once widespread throughout New England, but due to white-nose syndrome, the primary threat to its existence, the population in New England has declined by at least 90 percent. Currently, we do not have presence/absence data for this species for the vast majority of New England. Therefore, in order to assess effects of a project, we must assume presence in the absence of project-specific surveys. This has led to an increase in project review requests made to staff in this office.

In order to streamline the review process and provide regional guidance to Federal agencies and their applicants, the New England Field Office (NEFO) consulted with our state wildlife agency partners to develop regional time-of-year restrictions for tree clearing activities that if implemented, will avoid take of the NLEB. The time-of-year restrictions we are adopting vary, depending on the location of the proposed project.

The time-of-year restrictions described below are predicated on our conclusion that if surveys are not conducted to determine whether NLEBs are present, we must assume presence as long as suitable habitat is present. Based on regional data on NLEB presence and seasonal behavior, we recommend the following time-of-year restrictions to avoid adverse effects to bats that may be roosting in trees that could be cleared (assuming presence).

April 15 - October 31 - project is located within 1 mile or less from known hibernaculum

April 15 - September 30 - Known site - acoustic and/or mist-net confirmation - ("known site" as determined in consultation between NEFO and the State Natural Resource agency) **OR** projects located in "Coastal New England" where we appear to have greater numbers of NLEB based on recent acoustic surveys. "Coastal New England" includes all towns bordering the coast of Connecticut and Rhode Island, Massachusetts including Buzzards Bay, Cape Cod, Martha's

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 COMMERCIAL STREET, SUITE 300
CONCORD, NH 03301
PHONE: (603)223-2541 FAX: (603)223-0104
URL: www.fws.gov/newengland

Consultation Code: 05E1NE00-2015-SLI-1294 July 31, 2015
Event Code: 05E1NE00-2015-E-01715
Project Name: Lancaster 40522

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

United States Department of Interior
Fish and Wildlife Service

Project name: Lancaster 40522

Official Species List

Provided by:

New England Ecological Services Field Office
70 COMMERCIAL STREET, SUITE 300
CONCORD, NH 03301
(603) 223-2541
http://www.fws.gov/newengland

Consultation Code: 05E1NE00-2015-SLI-1294
Event Code: 05E1NE00-2015-E-01715

Project Type: TRANSPORTATION

Project Name: Lancaster 40522
Project Description: Emergency replacement of failing roadway slope and twin 24 inch culverts.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Counties: Coos, NH

United States Department of Interior
Fish and Wildlife Service

Project name: Lancaster 40522

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Matt Urban

From: vonOettingen, Susi <susi_vonoettingen@fws.gov>
Sent: Friday, July 31, 2015 1:04 PM
To: Matt Urban
Subject: Re: Lancaster 40522 (Project Submittal Form) Emergency Project

Yes, I was wondering about the 150 feet. I think you have a workable solution.

Thanks.

Susi

****

Susi von Oettingen
Endangered Species Biologist
New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301
(W) 603-223-2541 ext. 6418
Please note my new extension.

www.fws.gov/newengland

On Fri, Jul 31, 2015 at 12:49 PM, Matt Urban <MUrban@dot.state.nh.us> wrote:

Hi Susi,

I just heard back from our construction office and they were concerned about the staging commitment.

I've been told that we don't have existing ROW that would allow us to require the contractor to have their staging 150' away from the river.

That said, I have been told that because we are going to completely close the road for construction the contractor would likely have their preferred staging of equipment and materials directly on the existing pavement. We can add a commitment along the lines of: The contractor shall stage as far landward of the River as practicable with BMPs in place protecting the river and it's banks from the staging. I think this might be a reasonable compromise in combination with the existing commitments for stringent BMPS and covering exposed areas before a predicted storm.

Is this something you would be agreeable to?

Hi Susi,

This is helpful, we will add the two following commitments to our other project commitments based on your comments.

1. Exposed slopes adjacent to the Connecticut River shall be protected prior to a predicted storm event.

2. Staging of construction equipment and materials shall not be within 150 feet of the bank of the Connecticut River

In regards to the cofferdam impacts and potential for instability. I have spoken with the engineers and they have indicated that placing the cofferdams near the shoreline would keep the water away from our work, and our work away from the water. They are installed along the toe of the slope and extend parallel to the work to a location where they are installed perpendicular to the slope, and tie into the roadway. This method avoids creating an instability of the bank and allows it to be tied back into the natural slopes securely. All impacts areas have been approved by NHDES under the emergency authorization.

Thanks,

Matt Urban

From: vonOettingen, Susi [mailto:susi_vonoettingen@fws.gov]
Sent: Friday, July 31, 2015 11:04 AM
To: Matt Urban
Subject: Re: Lancaster 40522 (Project Submittal Form) Emergency Project

Great, thanks. Would the coffer dam avoid impacting the river? I'm uncertain how that works without causing some bank instability. If you could include erosion controls that require covering open earth in the event of a predicted storm, and staging construction equipment and materials well away from the river bank (150 feet or so?) that would be better yet.

Susi

****

From: vonOettingen, Susi [mailto:susi_vonoettingen@fws.gov]
Sent: Friday, July 31, 2015 10:06 AM
To: Matt Urban
Subject: Re: Lancaster 40522 (Project Submittal Form) Emergency Project

With respect to northern long-eared bat and lynx, yes I agree no effects. What erosion control measures will be in place for the mussels?

Susi

****

Susi von Oettingen

Endangered Species Biologist

New England Field Office

70 Commercial Street, Suite 300

Concord, NH 03301

(W) 603-223-2541 ext. 6418

Please note my new extension.

www.fws.gov/newengland

On Fri, Jul 31, 2015 at 9:53 AM, Matt Urban <MUrban@dot.state.nh.us> wrote:

Good Morning Susi,

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENVIRONMENT

NOTE TO FILE

Date: July 31, 2015

From: Matt Urban
Wetlands Program Manager

Subject: Lancaster Emergency
40522

RE: Cultural Resources

This project begins on NH Route 135 in Lancaster approximately 1,100 feet north of the Lancaster-Dalton Town line. The work on NH Route 135 consists of the installation of an 8'x6' box culvert replacing the failed twin 24" pipes. Also proposed is the construction of a 48" overflow pipe, construction of a retaining wall, shoulder repair, roadway repair, slope repair, full box reconstruction and guardrail replacement.

The project area was reviewed by the Cultural Resource Program Manager, Jill Edelmann, for cultural and historical resources and by the Cultural Resources Program Specialist, Sheila Charles, for archeological sites on the property on July 15th 2015. The Department of Transportation's Cultural Resource Manager has determined that there are no cultural resources present.

CERTIFICATION BY NHDHR

For the purpose of compliance with the Special Attention, Historic and Archeological Resources, dated February 14, 2003, relative to Federal-Aid Highway Project No. _____, NHDOT Project No. **40522**, I certify the following:

1. That I have reviewed the maps, plats, photographs or other identifying geographical information supplied to me by the Contractor.

2. That the areas located on these maps, etc. are to be utilized by the Contractor **Alvin J. Coleman and Son, Inc.** for the following purposes:

   a. Excavation area _____.
   b. Waste material area **x**.
   c. Storage or staging area **x**.
   d. Haul road _____.
   e. Other (describe) **The area is currently a small field with an ATV/Snowmobile trail running through it. We will be using approximately and acre.**

3. That I have reviewed the NHDHR site files relative to these locations and proposed uses.

4. On the basis of the above information, I have concluded that:

   No excavations on site. Area considered archaeologically sensitive, however staging area
   a. The location(s) have been previously reviewed, no resources have been identified, and there is no need for further archaeological evaluation ✓, for this purpose.
   b. The location(s) are such that no further archaeological evaluation is necessary _____.
   c. The location(s) are such that further field investigation is necessary _____.

Edna Feighner
NHDHR Review and Compliance Coordinator

9/16/15
Date

Received:

_____
NHDOT Contract Administrator

_____
Date

cc: FHWA
NH Division of Historical Resources
NHDOT, Bureau of Environment

Flooded Condition 7-2-15

FLOODED CONDITION 7-2-15

OUTLET OF CLOGGED TWIN 24" PIPES 7-7-15

LOSS OF ROAD, SHOULDER, and GUARDRAIL 7-7-15

SLOUGHING EMBANKMENT 7-7-15

SLOUGHING EMBANKMENT 7-7-15

SLOUGH STABILIZATION 10-19-15

INSTALLATION OF COFFER DAM TO CONSTRUCT RETAINING WALL IN THE DRY. 10-22-15

INLET PROTECTION 10-26-15

RETAINING WALL PREP 10-26-15

RETAINING WALL 10-30-15

INSTALLED 8'x6' BOX Replaced TWIN 24" pipes 11-30-15

STABILIZED RIVER SIDE 12-3-15

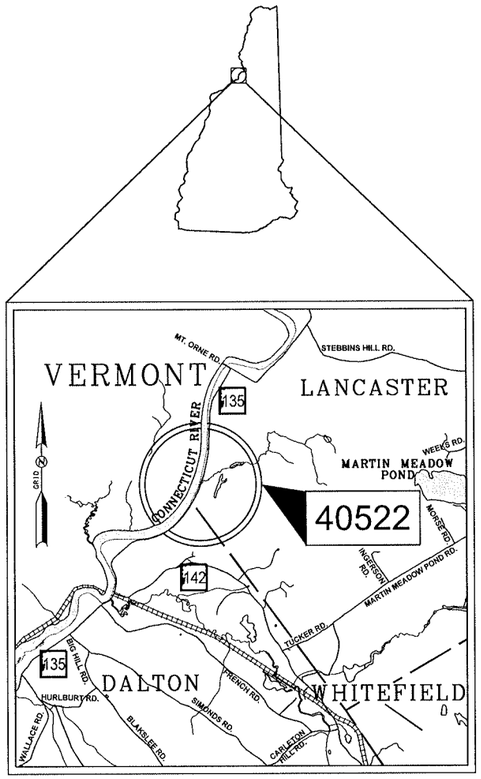
PAVEMENT & RAIL INSTALLED 12-8-15

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

WETLANDS PLANS
BETTERMENT PROJECT

NON-FEDERAL
NH PROJECT NO. 40522
NH ROUTE 135

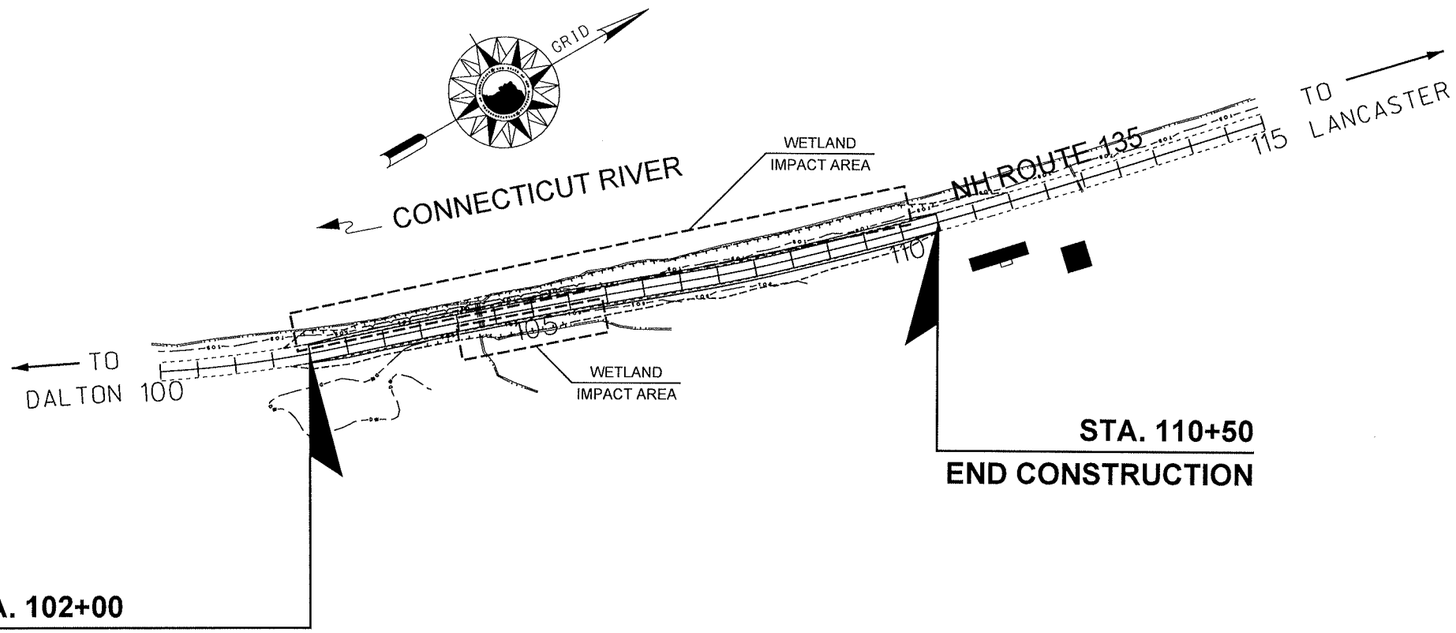
DESIGN DATA	
AVERAGE DAILY TRAFFIC 20 15	1016
AVERAGE DAILY TRAFFIC 20 ---	--
PERCENT OF TRUCKS	--
DESIGN SPEED	50 MPH
LENGTH OF PROJECT	1,100 FT



LOCATION MAP

1 1/2 0 1 2 mi.

GRAPHIC SCALE



INDEX OF SHEETS

DRAWN BY: L. SIIK DATE 12/24/15

CHECKED BY NHDOT DATE 12/24/15

TOWN OF LANCASTER

COUNTY OF COOS

SCALE: 1" = APPROXIMATELY 100'

FOR CONSTRUCTION DETAILS - SEE CONSTRUCTION PLANS

NHDOT THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR APPROVAL:

DIRECTOR OF PROJECT DEVELOPMENT — DATE

APPROVED:

ASSISTANT COMMISSIONER AND CHIEF ENGINEER — DATE

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR — DATE

FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
NON-FEDERAL	40522	1	7

GENERAL

EDGE OF PAVEMENT
TRAVELED WAY
PROPOSED ROADWAY
existing roadway
(pavement removed outside slope lines)

DRIVEWAYS
(label surface type)

BUILDINGS
(building to be removed)
(label house or type of building)

FOUNDATION
(label type)

LEACH FIELD
leach field

BRIDGE CROSSINGS
STREAM
OVERPASS

STEPS AND WALK
(label type)

INTERMITTENT WATER COURSE

SHORE LINE
river/stream
pond
(label name of water body)

POTENTIAL WET AREA SYMBOL

BRUSH OR WOODS LINE

TREES (PLANS)
(deciduous) (coniferous) (stump)
(show station, circumference in feet & type)

TREE OR STUMP (CROSS-SECTIONS)

HEDGE
(label type)

MONITORING WELL
mon

WELL

FLAG POLE
fp

ORIGINAL GROUND (TYPICALS)

ROCK OUTCROP

ROCK LINE (TYPICALS & SECTIONS ONLY)

GUARDRAIL (label type)
existing
PROPOSED
bgr
cgr

JERSEY BARRIER

CURB (LABEL TYPE)

STONE WALL

RETAINING WALL (LABEL TYPE)
(points toward retained ground)

FENCE (LABEL TYPE)

SIGNS
(single post)
(double post)

GAS PUMP
gp

FUEL TANK (ABOVE GROUND)
ft
(label size & type)

STORAGE TANK FILLER CAP
fc

SEPTIC TANK
S

GRAVE
gr

MAILBOX
mb

VENT PIPE
vp

SATELLITE DISH ANTENNA
da

PHONE
ph

GROUND LIGHT/LAMP POST
gl
lp

BORING LOCATION
B

TEST PIT
TP

INTERSTATE NUMBERED HIGHWAY
293

UNITED STATES NUMBERED HIGHWAY
3

STATE NUMBERED HIGHWAY
102

SHORELAND - WETLAND

WETLAND DESIGNATION AND TYPE
2
PUB2E

DELINEATED WETLAND — DW —
ORDINARY HIGH WATER — OHW —
TOP OF BANK — TOB —
TOP OF BANK & ORDINARY HIGH WATER — TOBOHW —
NORMAL HIGH WATER — NHW —
WIDTH AT BANK FULL — WBF —
PRIME WETLAND — PWET —
PRIME WETLAND 100' BUFFER — PWET100 —
NON-JURISDICTIONAL DRAINAGE AREA — NJDA —
COWARDIN DISTINCTION LINE — CDL —
TIDAL BUFFER ZONE — TBZ —
DEVELOPED TIDAL BUFFER ZONE — DTBZ —
HIGHEST OBSERVABLE TIDE LINE — HOTL —
MEAN HIGH WATER — MHW —
MEAN LOW WATER — MLW —
VERNAL POOL — VP —
SPECIAL AQUATIC SITE — SAS —
REFERENCE LINE — REF —
WATER FRONT BUFFER — WB50 —
NATURAL WOODLAND BUFFER — NWB150 —
PROTECTED SHORELAND — PS250 —
INVASIVE SPECIES LABEL
I.S. I / I.S. II
INVASIVE SPECIES — INV —

FLOODPLAIN / FLOODWAY

500 YEAR FLOODPLAIN BOUNDARY — FP500 —
100 YEAR FLOODPLAIN BOUNDARY — FP100 —
FLOODWAY — FW —

ENGINEERING

CONSTRUCTION BASELINE
30 31 32

PC, PT, POT (ON CONST BASELINE)

PI (IN CONSTRUCTION BASELINES)

INTERSECTION OR EQUATION OF TWO LINES

ORIGINAL GROUND LINE (PROFILES AND CROSS-SECTIONS)

PROFILE GRADE LINE (PROFILES AND CROSS-SECTIONS)

SLOPE LINE
CLEARING LINE

CLEARING LINE
SLOPE LINE

SLOPE LINE (FILL)

SLOPE LINE (CUT)

PROFILES AND CROSS SECTIONS:
ORIGINAL GROUND ELEVATION (LEFT)
FINISHED GRADE ELEVATION (RIGHT)
72.5
79.14

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN
STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	stdsymb1_2	40522	2	7

DRAINAGE

MANHOLE

CATCH BASIN — cb

DROP INLET — di

(existing) (PROPOSED)

DRAINAGE PIPE (existing) (label size & type)

DRAINAGE PIPE (PROPOSED)

UNDERDRAIN (existing) W/ FLUSHING BASIN — fb (label size & type)

UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN

show direction of flow

HEADER (existing & PROPOSED) (with stone outlet protection)

METAL or PLASTIC

END SECTION (existing & PROPOSED)

RCP

OPEN DITCH (PROPOSED)

EROSION CONTROL/ STONE SLOPE PROTECTION

BOUNDARIES / RIGHT-OF-WAY

RIGHT-OF-WAY LINE (label type)

RR RIGHT-OF-WAY LINE

PROPERTY LINE — PL —

PROPERTY LINE (COMMON OWNER) — Z —

TOWN LINE — BOW / CONCORD —

COUNTY LINE — COOS / GRAFTON —

STATE LINE — MAINE / NEW HAMPSHIRE —

NATIONAL FOREST

CONSERVATION LAND — LC —

BENCH MARK / SURVEY DISK

BOUND — bnd — (PROPOSED)

STATE LINE/ TOWN LINE MONUMENT — S/L — T/L

NHDOT PROJECT MARKER

IRON PIPE OR PIN — ip

DRILL HOLE IN ROCK — dh

TAX MAP AND LOT NUMBER — 156 / 14 — 1642/341 — 6.80 Ac.±

PROPERTY PARCEL NUMBER — 12

HISTORIC PROPERTY — H

UTILITIES

	existing	PROPOSED
TELEPHONE POLE		
POWER POLE		
JOINT OCCUPANCY		
MISCELLANEOUS/UNKNOWN POLE		
GUY POLE OR PUSH BRACE		

(plot point at face not center of symbol)

LIGHT POLE		
LIGHT ON POWER POLE		
LIGHT ON JOINT POLE		

POLE STATUS: REMOVE, LEAVE, PROPOSED, OR TEMPORARY AS APPLICABLE e.g.:

RAILROAD	(label ownership)	
RAILROAD SIGN		
RAILROAD SIGNAL		
UTILITY JUNCTION BOX	jb	JB
OVERHEAD ELECTRIC	OE	OE

UNDERGROUND UTILITIES

WATER (on existing lines label size, type and note if abandoned)	W	PW
SEWER	S	PS
TELEPHONE	T	PT
ELECTRIC	E	PE
GAS	G	PG
LIGHTING	L	PL
INTELLIGENT TRANSPORTATION SYSTEM	ITS	PITS
FIBER OPTIC	FO	PFO
WATER SHUT OFF	WSO	WSO
GAS SHUT OFF	GSO	GSO
HYDRANT	HYD	HYD

MANHOLES

SEWER	S	MHS
TELEPHONE	T	MHT
ELECTRICAL	E	MHE
GAS	G	MHG
UNKNOWN	U	

TRAFFIC SIGNALS / ITS

	existing	PROPOSED
MAST ARM (existing)		30' MA (NOTE ANGLE FROM ⊕)
OPTICOM RECEIVER		
OPTICOM STROBE		
TRAFFIC SIGNAL		
PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT		
SIGNAL CONDUIT	-C-C-C-	-PC-PC-PC-
CONTROLLER CABINET	cc	CC
METER PEDESTAL	mp	MP
PULL BOX	pb	PB
LOOP DETECTOR (QUADRUPOLE)		(label size)
LOOP DETECTOR (RECTANGULAR)		(label size)
CAMERA POLE (CCTV)		
FIBER OPTIC DELINEATOR	fod	FOD
FIBER OPTIC SPLICE VAULT		SVF
ITS EQUIPMENT CABINET	its	ITS
VARIABLE SPEED LIMIT SIGN		
DYNAMIC MESSAGE SIGN		
ROAD AND WEATHER INFO SYSTEM		

CONSTRUCTION NOTES

CURB MARK NUMBER - BITUMINOUS	B-1
CURB MARK NUMBER - GRANITE	G-1
CLEARING AND GRUBBING AREA	A
DRAINAGE NOTE	1
EROSION CONTROL NOTE	A
FENCING NOTE	A
GUARDRAIL NOTE	1
ITS NOTE	1
LIGHTING NOTE	A
TRAFFIC SIGNAL NOTE	1

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
11-21-2014	stdsymb1_2	40522	3	7

EROSION CONTROL STRATEGIES

1. ENVIRONMENTAL COMMITMENTS:
   1.1. THESE GUIDELINES DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH ANY CONTRACT PROVISIONS, OR APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
   1.2. THIS PROJECT WILL BE SUBJECT TO THE US EPA'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER CONSTRUCTION GENERAL PERMIT AS ADMINISTERED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THIS PROJECT IS SUBJECT TO REQUIREMENTS IN THE MOST RECENT CONSTRUCTION GENERAL PERMIT (CGP).
   1.3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE NHDES WETLAND PERMIT, THE US ARMY CORPS OF ENGINEERS PERMIT, WATER QUALITY CERTIFICATION AND THE SPECIAL ATTENTION ITEMS INCLUDED IN THE CONTRACT DOCUMENTS.
   1.4. ALL STORM WATER, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION (DECEMBER 2008) (BMP MANUAL) AVAILABLE FROM THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES).
   1.5. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17, AND ALL, PUBLISHED NHDES ALTERATION OF TERRAIN ENV-WQ 1500 REQUIREMENTS (HTTP://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM)
   1.6. THE CONTRACTOR IS DIRECTED TO REVIEW AND COMPLY WITH SECTION 107.1 OF THE CONTRACT AS IT REFERS TO SPILLAGE, AND ALSO WITH REGARDS TO EROSION, POLLUTION, AND TURBIDITY PRECAUTIONS.

2. STANDARD EROSION CONTROL SEQUENCING APPLICABLE TO ALL CONSTRUCTION PROJECTS:
   2.1. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH DISTURBING ACTIVITIES. PERIMETER CONTROLS AND STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AS SHOWN IN THE BMP MANUAL AND AS DIRECTED BY THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARER.
   2.2. EROSION, SEDIMENTATION CONTROL MEASURES AND INFILTRATION BASINS SHALL BE CLEANED, REPLACED AND AUGMENTED AS NECESSARY TO PREVENT SEDIMENTATION BEYOND PROJECT LIMITS THROUGHOUT THE PROJECT DURATION.
   2.3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT AND SECTION 645 OF THE NHDOT SPECIFICATIONS FOR ROAD AND BRIDGES CONSTRUCTION.
   2.4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
      (A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
      (B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
      (C) A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED;
      (D) TEMPORARY SLOPE STABILIZATION CONFORMING TO TABLE 1 HAS BEEN PROPERLY INSTALLED
   2.5. ALL STOCKPILES SHALL BE CONTAINED WITH A PERIMETER CONTROL. IF THE STOCKPILE IS TO REMAIN UNDISTURBED FOR MORE THAN 14 DAYS, MULCHING WILL BE REQUIRED.
   2.6. A WATER TRUCK SHALL BE AVAILABLE TO CONTROL EXCESSIVE DUST AT THE DIRECTION OF THE CONTRACT ADMINISTRATOR.
   2.7. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL REMAIN UNTIL THE AREA HAS BEEN PERMANENTLY STABILIZED.
   2.8. CONSTRUCTION PERFORMED ANY TIME BETWEEN NOVEMBER 30" AND MAY 1" OF ANY YEAR SHALL BE CONSIDERED WINTER CONSTRUCTION AND SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.
      (A) ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15", OR WHICH ARE DISTURBED AFTER OCTOBER 15", SHALL BE STABILIZED IN ACCORDANCE WITH TABLE 1.
      (B) ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15", OR WHICH ARE DISTURBED AFTER OCTOBER 15", SHALL BE STABILIZED TEMPORARILY WITH STONE OR IN ACCORDANCE WITH TABLE 1.
      (C) AFTER NOVEMBER 30" INCOMPLETE ROAD SURFACES, WHERE WORK HAS STOPPED FOR THE SEASON, SHALL BE PROTECTED IN ACCORDANCE WITH TABLE 1.
      (D) WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE PROJECT IS WITHOUT STABILIZATION AT ONE TIME, UNLESS A WINTER STABILIZATION PLAN HAS BEEN APPROVED BY NHDOT.
      (E) A SWPPP AMENDMENT SHALL BE SUBMITTED TO THE DEPARTMENT, FOR APPROVAL, ADDRESSING COLD WEATHER STABILIZATION (ENV-WQ 1505.05) NO LESS THAN 30 DAYS PRIOR TO THE COMMENCEMENT OF WORK SCHEDULED AFTER NOVEMBER 30".

GENERAL CONSTRUCTION PLANNING AND SELECTION OF STRATEGIES TO CONTROL EROSION AND SEDIMENT ON HIGHWAY CONSTRUCTION PROJECTS

3. PLAN ACTIVITIES TO ACCOUNT FOR SENSITIVE SITE CONDITIONS:
   3.1. CLEARLY FLAG AREAS TO BE PROTECTED IN THE FIELD AND PROVIDE CONSTRUCTION BARRIERS TO PREVENT TRAFFICKING OUTSIDE OF WORK AREAS.
   3.2. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS.
   3.3. PROTECT AND MAXIMIZE EXISTING NATIVE VEGETATION AND NATURAL FOREST BUFFERS BETWEEN CONSTRUCTION ACTIVITY AND SENSITIVE AREAS.
   3.4. WHEN WORK IS PERFORMED IN AND NEAR WATER COURSES, STREAM FLOW DIVERSION METHODS SHALL BE IMPLEMENTED PRIOR TO ANY EXCAVATION OR FILLING.
   3.5. WHEN WORK IS PERFORMED WITHIN 50 FEET OF SURFACE WATERS (WETLAND, OPEN WATER OR FLOWING WATER), PERIMETER CONTROL SHALL BE ENHANCED CONSISTENT WITH SECTION 2.1.2.1. OF THE 2012 NPDES CONSTRUCTION GENERAL PERMIT.

4. MINIMIZE THE AMOUNT OF EXPOSED SOIL:
   4.1. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS. MINIMIZE THE AREA OF EXPOSED SOIL AT ANY ONE TIME. PHASING SHALL BE USED TO REDUCE THE AMOUNT AND DURATION OF SOIL EXPOSED TO THE ELEMENTS AND VEHICLE TRACKING.
   4.2. UTILIZE TEMPORARY MULCHING OR PROVIDE ALTERNATE TEMPORARY STABILIZATION ON EXPOSED SOILS IN ACCORDANCE WITH TABLE 1.
   4.3. THE MAXIMUM AMOUNT OF DISTURBED EARTH SHALL NOT EXCEED A TOTAL OF 5 ACRES FROM MAY 1" THROUGH NOVEMBER 30". OR EXCEED ONE ACRE DURING WINTER MONTHS, UNLESS THE CONTRACTOR DEMONSTRATES TO THE DEPARTMENT THAT THE ADDITIONAL AREA OF DISTURBANCE IS NECESSARY TO MEET THE CONTRACTORS CRITICAL PATH METHOD SCHEDULE (CPM), AND THE CONTRACTOR HAS ADEQUATE RESOURCES AVAILABLE TO ENSURE THAT ENVIRONMENTAL COMMITMENTS WILL BE MET.

5. CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT:
   5.1. DIVERT OFF SITE RUNOFF OR CLEAN WATER AWAY FROM THE CONSTRUCTION ACTIVITY TO REDUCE THE VOLUME THAT NEEDS TO BE TREATED ON SITE.
   5.2. DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM DISTURBED AREAS, SLOPES, AND AROUND ACTIVE WORK AREAS AND TO A STABILIZED OUTLET LOCATION.
   5.3. CONSTRUCT IMPERMEABLE BARRIERS AS NECESSARY TO COLLECT OR DIVERT CONCENTRATED FLOWS FROM WORK OR DISTURBED AREAS.
   5.4. STABILIZE, TO APPROPRIATE ANTICIPATED VELOCITIES, CONVEYANCE CHANNELS OR PUMPING SYSTEMS NEEDED TO CONVEY CONSTRUCTION STORMWATER TO BASINS AND DISCHARGE LOCATIONS PRIOR TO USE.
   5.5. DIVERT OFF-SITE WATER THROUGH THE PROJECT IN AN APPROPRIATE MANNER SO NOT TO DISTURB THE UPSTREAM OR DOWNSTREAM SOILS, VEGETATION OR HYDROLOGY BEYOND THE PERMITTED AREA.

6. PROTECT SLOPES:
   6.1. INTERCEPT AND DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM UNPROTECTED AND NEWLY ESTABLISHED AREAS AND SLOPES TO A STABILIZED OUTLET OR CONVEYANCE.
   6.2. CONSIDER HOW GROUNDWATER SEEPAGE ON CUT SLOPES MAY IMPACT SLOPE STABILITY AND INCORPORATE APPROPRIATE MEASURES TO MINIMIZE EROSION.
   6.3. CONVEY STORMWATER DOWN THE SLOPE IN A STABILIZED CHANNEL OR SLOPE DRAIN.
   6.4. THE OUTER FACE OF THE FILL SLOPE SHOULD BE IN A LOOSE RUFFLED CONDITION PRIOR TO TURF ESTABLISHMENT. TOPSOIL OR HUMUS LAYERS SHALL BE TRACKED UP AND DOWN THE SLOPE, DISKED, HARROWED, DRAGGED WITH A CHAIN OR MAT, MACHINE-RAKED, OR HAND-WORKED TO PRODUCE A RUFFLED SURFACE.

7. ESTABLISH STABILIZED CONSTRUCTION EXITS:
   7.1. INSTALL AND MAINTAIN CONSTRUCTION EXITS, ANYWHERE TRAFFIC LEAVES A CONSTRUCTION SITE ONTO A PUBLIC RIGHT-OF-WAY.
   7.2. SWEEP ALL CONSTRUCTION RELATED DEBRIS AND SOIL FROM THE ADJACENT PAVED ROADWAYS AS NECESSARY.

8. PROTECT STORM DRAIN INLETS:
   8.1. DIVERT SEDIMENT LADEN WATER AWAY FROM INLET STRUCTURES TO THE EXTENT POSSIBLE.
   8.2. INSTALL SEDIMENT BARRIERS AND SEDIMENT TRAPS AT INLETS TO PREVENT SEDIMENT FROM ENTERING THE DRAINAGE SYSTEM.
   8.3. CLEAN CATCH BASINS, DRAINAGE PIPES, AND CULVERTS IF SIGNIFICANT SEDIMENT IS DEPOSITED.
   8.4. DROP INLET SEDIMENT BARRIERS SHOULD NEVER BE USED AS THE PRIMARY MEANS OF SEDIMENT CONTROL AND SHOULD ONLY BE USED TO PROVIDE AN ADDITIONAL LEVEL OF PROTECTION TO STRUCTURES AND DOWN-GRADIENT SENSITIVE RECEPTORS.

9. SOIL STABILIZATION:
   9.1. WITHIN THREE DAYS OF THE LAST ACTIVITY IN AN AREA, ALL EXPOSED SOIL AREAS, WHERE CONSTRUCTION ACTIVITIES ARE COMPLETE, SHALL BE STABILIZED.
   9.2. IN ALL AREAS, TEMPORARY SOIL STABILIZATION MEASURES SHALL BE APPLIED IN ACCORDANCE WITH THE STABILIZATION REQUIREMENTS (SECTION 2.2) OF THE 2012 CGP. (SEE TABLE 1 FOR GUIDANCE ON THE SELECTION OF TEMPORARY SOIL STABILIZATION MEASURES.)
   9.3. EROSION CONTROL SEED MIX SHALL BE SOWN IN ALL INACTIVE CONSTRUCTION AREAS THAT WILL NOT BE PERMANENTLY SEEDED WITHIN TWO WEEKS OF DISTURBANCE AND PRIOR TO SEPTEMBER 15, OF ANY GIVEN YEAR, IN ORDER TO ACHIEVE VEGETATIVE STABILIZATION PRIOR TO THE END OF THE GROWING SEASON.
   9.4. SOIL TACKIFIERS MAY BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND REAPPLIED AS NECESSARY TO MINIMIZE SOIL AND MULCH LOSS UNTIL PERMANENT VEGETATION IS ESTABLISHED.

10. RETAIN SEDIMENT ON-SITE AND CONTROL DEWATERING PRACTICES:
   10.1. TEMPORARY SEDIMENT BASINS (CGP-SECTION 2.1.3.2) OR SEDIMENT TRAPS (ENV-WQ 1506.10) SHALL BE SIZED TO RETAIN, ON SITE, THE VOLUME OF A 2-YEAR 24-HOUR STORM EVENT FOR ANY AREA OF DISTURBANCE OR 3,600 CUBIC FEET OF STORMWATER RUNOFF PER ACRE OF DISTURBANCE, WHICHEVER IS GREATER. TEMPORARY SEDIMENT BASINS USED TO TREAT STORMWATER RUNOFF FROM AREAS GREATER THAN 5-ACRES OF DISTURBANCE SHALL BE SIZED TO ALSO CONTROL STORMWATER RUNOFF FROM A 10-YEAR 24 HOUR STORM EVENT. ON-SITE RETENTION OF THE 10-YEAR 24-HOUR EVENT IS NOT REQUIRED.
   10.2. CONSTRUCT AND STABILIZE DEWATERING INFILTRATION BASINS PRIOR TO ANY EXCAVATION THAT MAY REQUIRE DEWATERING.
   10.3. TEMPORARY SEDIMENT BASINS OR TRAPS SHALL BE PLACED AND STABILIZED AT LOCATIONS WHERE CONCENTRATED FLOW (CHANNELS AND PIPES) DISCHARGE TO THE SURROUNDING ENVIRONMENT FROM AREAS OF UNSTABILIZED EARTH DISTURBING ACTIVITIES.

11. ADDITIONAL EROSION AND SEDIMENT CONTROL GENERAL PRACTICES:
   11.1. USE TEMPORARY MULCHING, PERMANENT MULCHING, TEMPORARY VEGETATIVE COVER, AND PERMANENT VEGETATIVE COVER TO REDUCE THE NEED FOR DUST CONTROL. USE MECHANICAL SWEEPERS ON PAVED SURFACES WHERE NECESSARY TO PREVENT DUST BUILDUP. APPLY WATER, OR OTHER DUST INHIBITING AGENTS OR TACKIFIERS, AS APPROVED BY THE NHDES.
   11.2. ALL STOCKPILES SHALL BE CONTAINED WITH TEMPORARY PERIMETER CONTROLS. INACTIVE SOIL STOCKPILES SHOULD BE PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY EROSION CONTROL SEED MIX AND MULCH, SOIL BINDER) OR COVERED WITH ANCHORED TARPS.
   11.3. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH SECTION 645 OF NHDOT SPECIFICATIONS, WEEKLY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.25 IN. OF RAIN PER 24-HOUR PERIOD. EROSION AND SEDIMENT CONTROL MEASURES WILL ALSO BE INSPECTED IN ACCORDANCE WITH THE GUIDANCE MEMO FROM THE NHDES CONTAINED WITHIN THE CONTRACT PROPOSAL AND THE EPA CONSTRUCTION GENERAL PERMIT.
   11.4. THE CONTRACTOR SHOULD UTILIZE STORM DRAIN INLET PROTECTION TO PREVENT SEDIMENT FROM ENTERING A STORM DRAINAGE SYSTEM PRIOR TO THE PERMANENT STABILIZATION OF THE CONTRIBUTING DISTURBED AREA.
   11.5. PERMANENT STABILIZATION MEASURES WILL BE CONSTRUCTED AND MAINTAINED IN LOCATIONS AS SHOWN ON THE CONSTRUCTION PLANS TO STABILIZE AREAS. VEGETATIVE STABILIZATION SHALL NOT BE CONSIDERED PERMANENTLY STABILIZED UNTIL VEGETATIVE GROWTH COVERS AT LEAST 85% OF THE DISTURBED AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL FOR ONE YEAR AFTER PROJECT COMPLETION.
   11.6. CATCH BASINS: CARE SHALL BE TAKEN TO ENSURE THAT SEDIMENTS DO NOT ENTER ANY EXISTING CATCH BASINS DURING CONSTRUCTION. THE CONTRACTOR SHALL PLACE TEMPORARY STONE INLET PROTECTION OVER INLETS IN AREAS OF SOIL DISTURBANCE THAT ARE SUBJECT TO SEDIMENT CONTAMINATION.
   11.7. TEMPORARY AND PERMANENT DITCHES SHALL BE CONSTRUCTED, STABILIZED AND MAINTAINED IN A MANNER THAT WILL MINIMIZE SCOUR. TEMPORARY AND PERMANENT DITCHES SHALL BE DIRECTED TO DRAIN TO SEDIMENT BASINS OR STORM WATER COLLECTION AREAS.
   11.8. WINTER EXCAVATION AND EARTHWORK ACTIVITIES NEED TO BE LIMITED IN EXTENT AND DURATION, TO MINIMIZE POTENTIAL EROSION AND SEDIMENTATION IMPACTS. THE AREA OF EXPOSED SOIL SHALL BE LIMITED TO ONE ACRE, OR THAT WHICH CAN BE STABILIZED AT THE END OF EACH DAY UNLESS A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, IS REVIEWED AND APPROVED BY THE DEPARTMENT.
   11.9. CHANNEL PROTECTION MEASURES SHALL BE SUPPLEMENTED WITH PERIMETER CONTROL MEASURES WHEN THE DITCH LINES OCCUR AT THE BOTTOM OF LONG FILL SLOPES. THE PERIMETER CONTROLS SHALL BE INSTALLED ON THE FILL SLOPE TO MINIMIZE THE POTENTIAL FOR FILL SLOPE SEDIMENT DEPOSITS IN THE DITCH LINE.

BEST MANAGEMENT PRACTICES (BMP) BASED ON AMOUNT OF OPEN CONSTRUCTION AREA

12. STRATEGIES SPECIFIC TO OPEN AREAS LESS THAN 5 ACRES:
   12.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500; ALTERATION OF TERRAIN FOR CONSTRUCTION AND USE ALL CONVENTIONAL BMP STRATEGIES.
   12.2. SLOPES STEEPER THAN 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING.
   12.3. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT ALONE.
   12.4. AREAS WHERE HAUL ROADS ARE CONSTRUCTED AND STORMWATER CANNOT BE TREATED THE DEPARTMENT WILL CONSIDER INFILTRATION.
   12.5. FOR HAUL ROADS ADJACENT TO SENSITIVE ENVIRONMENTAL AREAS OR STEEPER THAN 5%, THE DEPARTMENT WILL CONSIDER USING EROSION STONE, CRUSHED GRAVEL, OR CRUSHED STONE BASE TO HELP MINIMIZE EROSION ISSUES.
   12.6. ALL AREAS THAT CAN BE STABILIZED SHALL BE STABILIZED PRIOR TO OPENING UP NEW TERRITORY.
   12.7. DETENTION BASINS SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE A 2 YEAR STORM EVENT.

13. STRATEGIES SPECIFIC TO OPEN AREAS BETWEEN 5 AND 10 ACRES:
   13.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES WILL BE UTILIZED.
   13.2. DETENTION BASINS WILL BE CONSTRUCTED TO ACCOMMODATE THE 2-YEAR 24-HOUR STORM EVENT AND CONTROL A 10-YEAR 24-HOUR STORM EVENT.
   13.3. SLOPES STEEPER THAN A 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS. OTHER ALTERNATIVE MEASURES, SUCH AS BONDED FIBER MATRIXES (BFMS) OR FLEXIBLE GROWTH MEDIUMS (FGMS) MAY BE UTILIZED, IF MEETING THE NHDES APPROVALS AND REGULATIONS.
   13.4. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS.

14. STRATEGIES SPECIFIC TO OPEN AREAS OVER 10 ACRES:
   14.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV-WQ 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES AND BETWEEN 5 AND 10 ACRES WILL BE UTILIZED.
   14.2. THE DEPARTMENT ANTICIPATES THAT SOIL BINDERS WILL BE NEEDED ON ALL SLOPES STEEPER THAN 3:1, IN ORDER TO MINIMIZE EROSION AND REDUCE THE AMOUNT OF SEDIMENT IN THE STORMWATER TREATMENT BASINS.
   14.3. THE CONTRACTOR WILL BE REQUIRED TO HAVE AN APPROVED DESIGN IN ACCORDANCE WITH ENV-WQ 1506.12 FOR AN ACTIVE FLOCCULANT TREATMENT SYSTEM TO TREAT AND RELEASE WATER CAPTURED IN STORM WATER BASINS. THE CONTRACTOR SHALL ALSO RETAIN THE SERVICES OF AN ENVIRONMENTAL CONSULTANT WHO HAS DEMONSTRATED EXPERIENCE IN THE DESIGN OF FLOCCULANT TREATMENT SYSTEMS. THE CONSULTANT WILL ALSO BE RESPONSIBLE FOR THE IMPLEMENTATION AND MONITORING OF THE SYSTEM.

TABLE 1
GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES

APPLICATION AREAS	DRY MULCH METHODS				HYDRAULICALLY APPLIED MULCHES[2]				ROLLED EROSION CONTROL BLANKETS[3]			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNSCB	DNCB
SLOPES[1]												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES*	YES*	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES
3:1 SLOPE	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO
4:1 SLOPE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
WINTER STABILIZATION	4T/AC	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
CHANNELS												
LOW FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
HIGH FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE
HMT	HAY MULCH & TACK	HM	HYDRAULIC MULCH	SNSB	SINGLE NET STRAW BLANKET
WC	WOOD CHIPS	SMM	STABILIZED MULCH MATRIX	DNSB	DOUBLE NET STRAW BLANKET
SG	STUMP GRINDINGS	BFM	BONDED FIBER MATRIX	DNSCB	2 NET STRAW-COCONUT BLANKET
CB	COMPOST BLANKET	FRM	FIBER REINFORCED MEDIUM	DNCB	2 NET COCONUT BLANKET

NOTES:
1. ALL SLOPE STABILIZATION OPTIONS ASSUME A SLOPE LENGTH ≤10 TIMES THE HORIZONTAL DISTANCE COMPONENT OF THE SLOPE, IN FEET.
2. PRODUCTS CONTAINING POLYACRYLAMIDE (PAM) SHALL NOT BE APPLIED DIRECTLY TO OR WITHIN 100 FEET OF ANY SURFACE WATER WITHOUT PRIOR WRITTEN APPROVAL FROM THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES.
3. ALL EROSION CONTROL BLANKETS SHALL BE MADE WITH WILDLIFE FRIENDLY BIODEGRADABLE NETTING.

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ∘ BUREAU OF HIGHWAY DESIGN

WETLAND PLANS
EROSION CONTROL STRATEGIES
AND STABILIZATION MATRIX

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
01-10-2013	40522errosstrat	40522	4	7

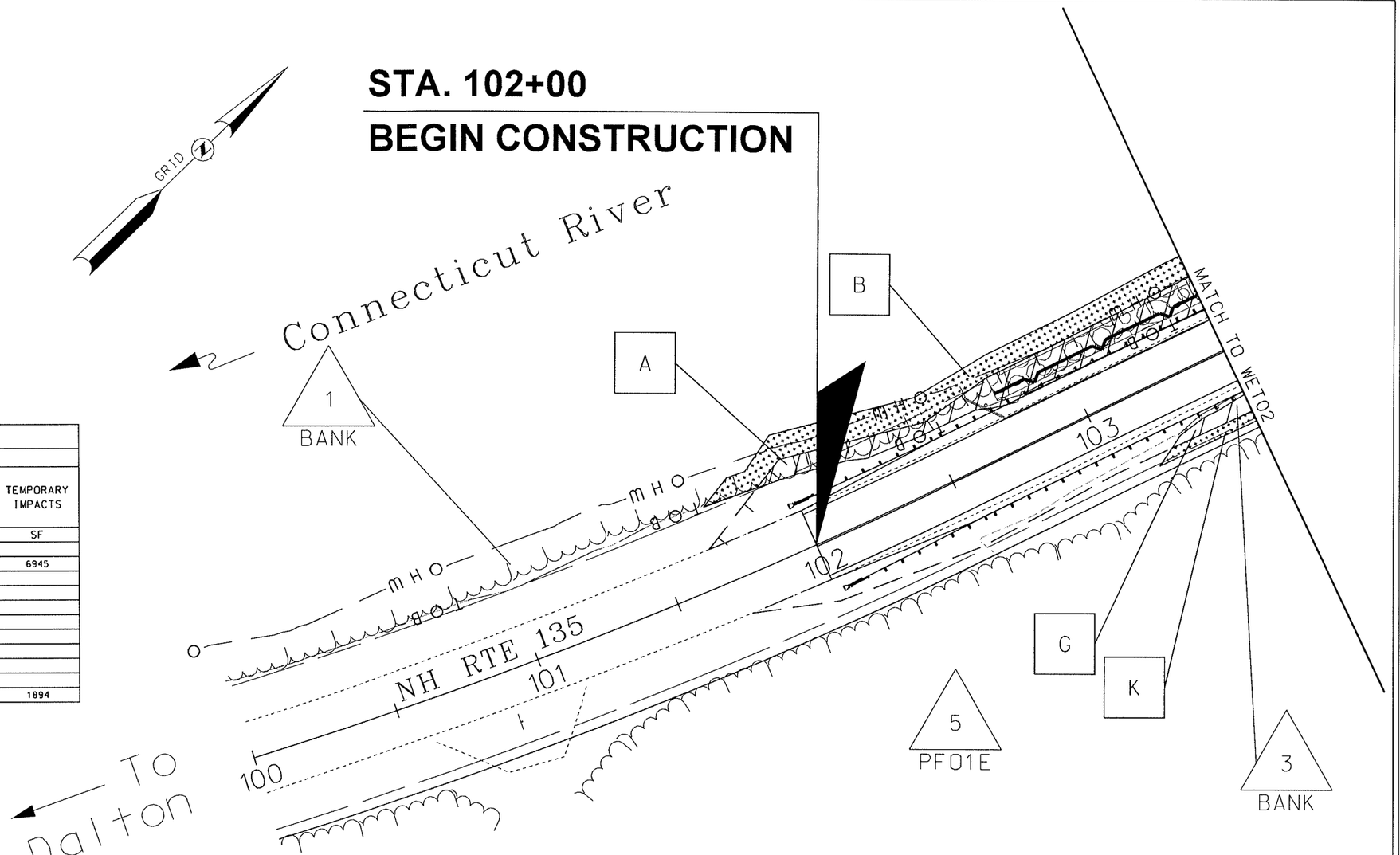
REVISIONS AFTER PROPOSAL			
NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED	DATE		
NEW DESIGN	NHDOT	DATE	12/23/2015
SHEET CHECKED	NHDOT	DATE	12/23/2015
AS BUILT DETAILS		DATE	

WETLAND IMPACT SUMMARY					
WETLAND NUMBER	WETLAND CLASSIFICATION	LOCATION	AREA		
			PERMANENT IMPACTS		TEMPORARY IMPACTS
			N.H.W.B. (NON-WETLAND)	N.H.W.B. & A.C.O.E. (WETLAND)	
			SF	SF	SF
1	BANK	A	11849		
2	R2UB2	B			6945
2	R2UB2	C		127	
2	R2UB2	D		7	
2	R2UB2	E		13	
2	R2UB2	F		100	
3	BANK	G	3310		
4	R2UB2	H		36	
3	BANK	I	573		
4	R2UB2	J		72	
3	BANK	K			1894

PERMANENT IMPACTS: 16087 SF
TEMPORARY IMPACTS: 8839 SF

TOTAL IMPACTS: 24926 SF



WETLAND CLASSIFICATION CODES	
R2UB2	RIVERINE LOWER PERENNIAL UNCONSOLIDATED BOTTOM SAND
BANK	BANK
PF01E	PALUSTRINE, FORESTED, BROAD-LEAVED DECIDOUS, SEASONALLY FLOODED/SATURATED

DELINEATION BY MATT URBAN JULY 2015

LEGEND

TYPE OF WETLAND IMPACT	SHADING/ HATCHING
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	
TEMPORARY IMPACTS	

WETLAND DESIGNATION NUMBER

WETLAND IMPACT LOCATION

WETLAND MITIGATION AREA

MITIGATION

20 0 20 40
SCALE IN FEET

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ○ BUREAU OF HIGHWAY DESIGN

EMERGENCY FOLLOW-UP WETLAND IMPACT PLANS

MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
WET01	40522wetplans	40522	5	7

GRID N

Connecticut River

MATCH TO WET01

MATCH TO WET03

24"cmp
24"cmp

48" RCP

C

B

A

D

2
R2UB2

E

F

1
BANK

104

105

106

107

NH RTE 135

TOB

OHW

8' x 6'
BOX
CULVERT

H

K

G

3
BANK

I

4
R2UB2

20 0 20 40
SCALE IN FEET

REVISIONS AFTER PROPOSAL

NUMBER	DESCRIPTION	STATION	STATION	DATE

SDR PROCESSED	DATE	
NEW DESIGN NHDOT	DATE	12/23/2015
SHEET CHECKED NHDOT	DATE	12/23/2015
AS BUILT DETAILS	DATE	

STATE OF NEW HAMPSHIRE

DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

EMERGENCY FOLLOW-UP WETLAND IMPACT PLANS

MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
WET02	40522wetplans	40522	6	7

GRID N

STA. 110+50
END CONSTRUCTION

A
B
J

1
BANK

Connecticut River

end plugged

MATCH TO WET02

108
109
110
111
112

NH RTE 135

To
Lancaster

mb
an

3
BANK

I

modular home

2 story
2 bay
garage

20 0 20 40
SCALE IN FEET

REVISIONS AFTER PROPOSAL

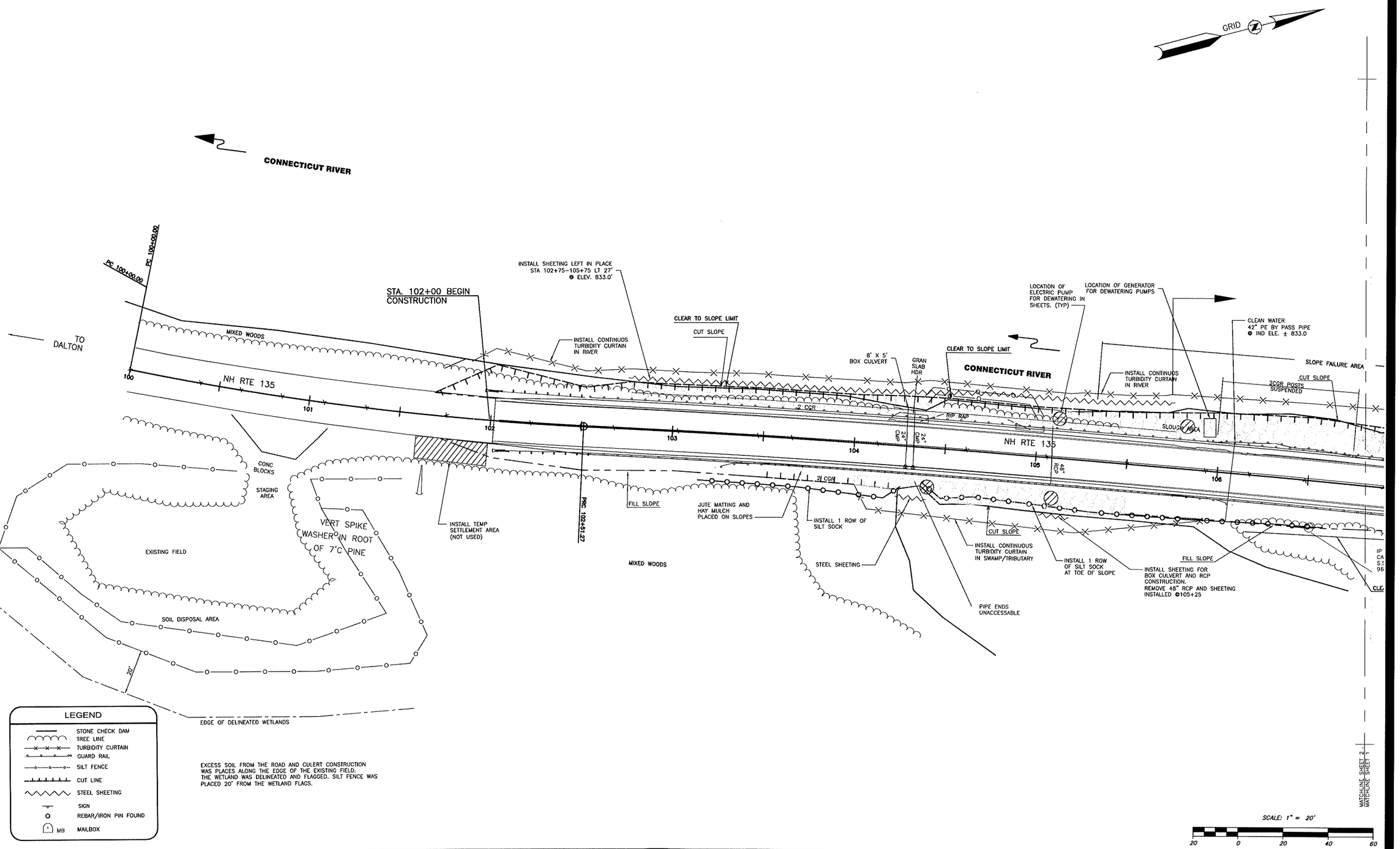
NUMBER	DATE	STATION	DESCRIPTION

SDR PROCESSED	DATE	
NEW DESIGN NHDOT	DATE	12/23/2015
SHEET CHECKED NHDOT	DATE	12/23/2015
AS BUILT DETAILS	DATE	

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION ◦ BUREAU OF HIGHWAY DESIGN

EMERGENCY FOLLOW-UP
WETLAND IMPACT PLANS

MODEL	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
WET03	40522wetplans	40522	7	7



HOLDEN ENGINEERING & SURVEYING, Inc.

56 Old Suncook Road – Unit #4
PO Box 480 Concord, N.H. 03302
(603) 225-6449

9 Constitution Drive
Bedford, N.H. 03110
(603) 472-2078

EROSION CONTROL PLAN
NH RTE 135
LANCASTER, NEW HAMPSHIRE

Date:	Revisions	Dr. By	Chk. By
09-15-2015	ADD PUMPING INFO AND REVISE SILT FENCE	REL	PDH
10-19-2015	CHANGES PER FIELD INSPECTION	SP	PDH
01-08-2016	UPDATE EROSION CONTROL MEASURES USED	SP	PDH
01-14-2016	UPDATE EROSION CONTROL MEASURES USED	SP	PDH

Book | Page

Date: 09/07/2015
Scale: 1" = 20'
Dr. By: SP Ck By: PH
Job No. 1520317
Sheet no 1 of 3

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GRID N

TURBIDITY CURTAIN
REMOVED ON 10/19/15
INSTALLED IN SWAP ON RT
LENTH = 200'

CLASS A STONE SLOPE
COVERED WITH NATIVE
TOP SOIL IN SHADED AREA
COVERED WITH GRASS
SEED AND MATTING

STA. 110+50 END
CONSTRUCTION

FILL SLOPE

PCC 111+50.04

CLEARING LINE (TYP.)

INSTALL CONTINUOS
TURBIDITY CURTAIN
IN RIVER

CUT SLOPE

CONNECTICUT RIVER

AREA

PRC 107+06.17

PT 108+99.53

PC 108+06.54

SLOUGH AREA

BRUSH/SCATTERED TREES

END PLUGGED

18" RCP

MIXED WOODS

NH RTE 135

107 108 109 110 111 112 113 114

IP REBAR BLUE
CAP THOMAS
S.SMITH LLS
969

MIXED WOODS

CLEARING LINE (TYP.)

INSTALL 1 ROW
OF SILT SOCK

FILL SLOPE

JUTE MATTING AND
HAY MULCH
PLACED ON SLOPES

TEMPORARY
SETTLEMENT BASIN

FIELD

STONE DR

MB

AN

PSNH/20
128/VZ70/182

MATCHLINE SHEET 2
MATCHLINE SHEET 1

IP ?REBAR
ORANGE CAP
NHLLS 351

LEGEND

- STONE CHECK DAM
- TREE LINE
- TURBIDITY CURTAIN
- GUARD RAIL
- SILT FENCE
- CUT LINE
- STEEL SHEETING
- SIGN
- REBAR/IRON PIN FOUND
- MB MAILBOX

SCALE: 1" = 20'

20 0 20 40 60

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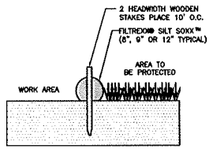
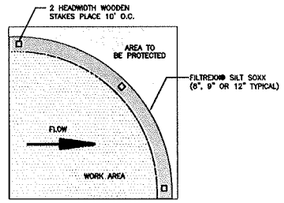
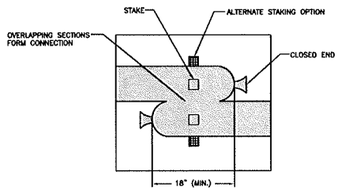
Sheet no 2 of 3

FILTREXX® SILT SOXX™

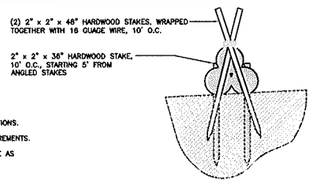




COMPOST SOCK CONNECTION DETAIL

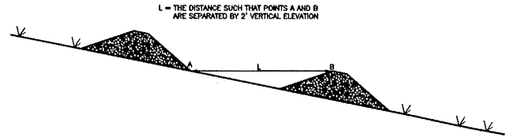


FILTREXX® PYRAMID STACKING DETAIL



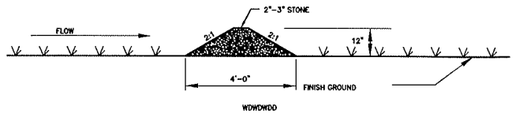
NOTES:

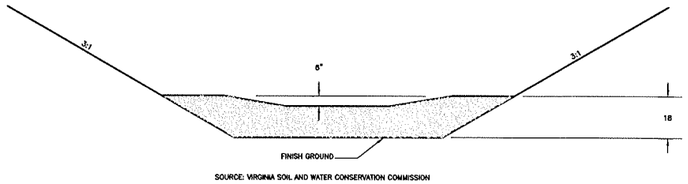
1. ALL MATERIALS TO MEET FILTREXX® SPECIFICATIONS.
2. SILT SOXX™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE AS DETERMINED BY ENGINEER.



SPACING BETWEEN STRUCTURES

NOT TO SCALE

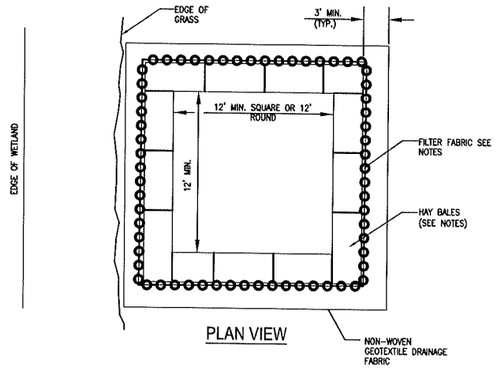




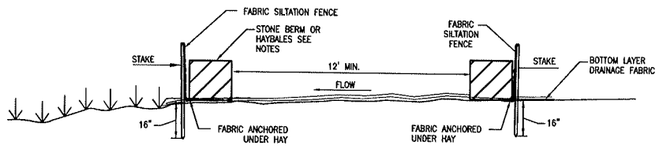
SOURCE: VIRGINIA SOIL AND WATER CONSERVATION COMMISSION

TEMPORARY & PERMANENT ROCK DAM DETAIL

NOT TO SCALE



PLAN VIEW



SECTION

TEMPORARY SETTLEMENT BASIN

NOTES:

1. ALL MATERIALS TO MEET FILTREXX® SPECIFICATIONS.
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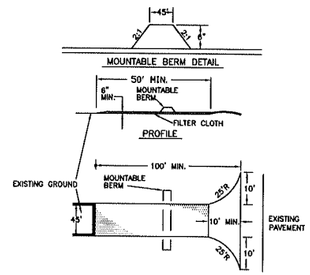
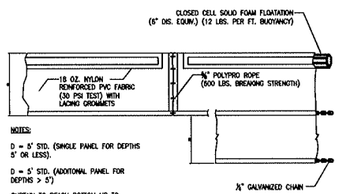


NOTES:

1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 2 TO 4 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES
3. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE.
4. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE.
5. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED OR TRACKED ONTO PUBLIC RIGHT OF WAY MUST BE REMOVED PROMPTLY
6. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

TEMPORARY STABILIZED CONSTRUCTION ENTRANCE

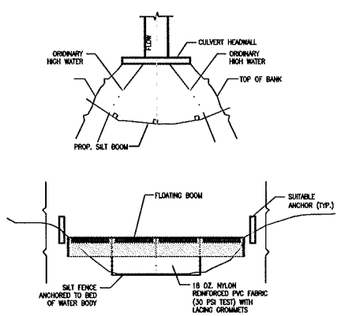


NOTES:

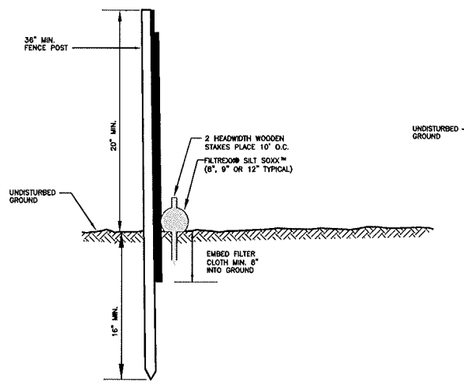
D = 6' STD. (SINGLE PANEL FOR DEPTHS 5' OR LESS).

D = 5' STD. (ADDITIONAL PANEL FOR DEPTHS > 5')

CURTAIN TO REACH BOTTOM UP TO DEPTHS OF 10 FEET. TWO (2) PANELS TO BE USED FOR DEPTHS GREATER THAN 10 FEET UNLESS OTHERWISE SPECIFIED IN THE CONSTRUCTION PLANS OR AS DIRECTED BY THE ENGINEER.

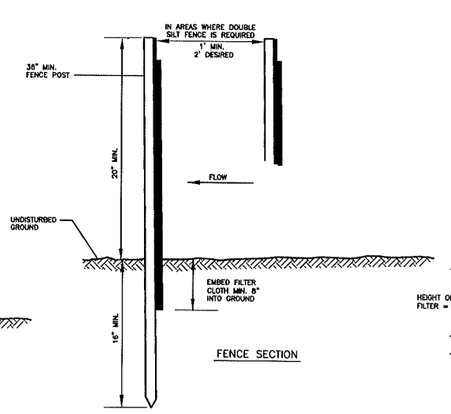


SILT BOOM DETAIL

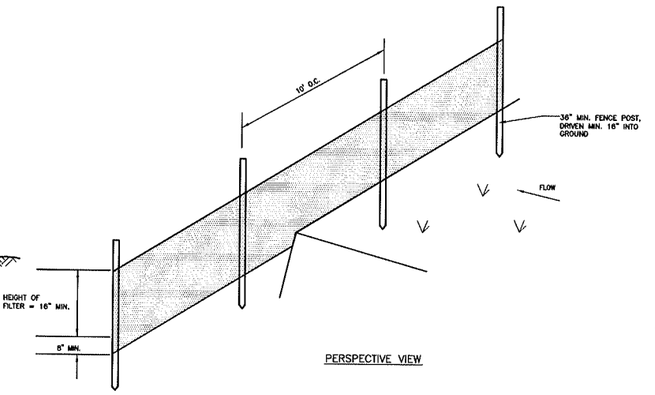


SILT FENCE WITH SILT SOCK

NOT TO SCALE



FENCE SECTION



PERSPECTIVE VIEW

NOTES:

1. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACES EVERY 24" AT TOP, MID SECTION, AND BOTTOM.
2. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES, FOLDED AND STAPLED.
3. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

TEMPORARY FABRIC SILTATION FENCE

SCALE: 1" = 20'

20 0 20 40 60

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